University of the West of England
BRISTOL

ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Financial Engineering					
Module Code	UMADHY-15-M		Level	M	Version	1
UWE Credit Rating	15	ECTS Credit Rating	7.5	WBL module?	No	
Owning Faculty	Faculty of Business and Law		Field	Accounting and Finance		
Department	Accounting, Economics and Finance		Module Type	Standard		
Contributes towards	MSc Finance					
Pre-requisites	None		Co- requisites	None		
Excluded Combinations	None		Module Entry requirements	n/a		
First CAP Approval Date	26 March 2015		Valid from	September 2015		
Revision CAP Approval Date			Revised with effect from			

Review Date	September 2021

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module a student will be able to: 1. Understand the basic approaches to asset allocation and asset management, including how to combine various asset classes into portfolios in a real-world setting [A and B]; 2. Apply techniques to value financial instruments, especially derivatives and their use hedging purposes [A and B]; 3. Apply quantitative skills to synthetically replicate financial instruments and price options, including the Binomial Model and Black-Scholes [A and B]; 4. Apply replication of cash flows and asset valuation under no-arbitrage assumptions and the law of one price. [A and B]; 5. Manipulate the characteristics of different options with Excel [A and B] Display advanced spreadsheet skills and data manipulation techniques especially in Excel and VBA [B]; 6. Apply a range of valuation techniques to derivative instruments and credit risk-adjusted bonds [A and B]; 7. Understand, discuss and critically evaluate the theoretical underpinning of investment management and its institutional context and consider how investment theory can be applied to improve financial investment decisions in the real world [A and B]; 8. Communicate information, ideas, arguments, concepts, theories and develop

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<tr><td></td><td>an argument in a clearly and effectively organised essay or report [B].</td></tr>
<tr><td>Syllabus Outline</td><td>

Introduction to Options
The Binomial Option Pricing Model
The Black-Scholes Model
The Greeks
Portfolio Insurance
Introduction to Monte Carlo Methods
Option Pricing with Monte Carlo Methods
Exotic Options
Calculating Default-Adjusted Expected Bond Returns
Volatility and Volatility Smiles
Credit Derivatives
Training in VBA and Excel

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<tr><td>Contact Hours</td><td>Module delivery will be face to face for 3 hours per week over a 12 week term time.</td></tr>
<tr><td>Teaching and Learning Methods</td><td>

This module will utilise a variety of approaches including lectures, workshops, case studies, problem solving exercises, individual and group reflection and feedback.
Students will be confronted with a series of practical exercises and will be actively required to use Excel modelling and VBA programming techniques.
The contact sessions are supported by further materials, Bloomberg activities and other activities provided on Blackboard.

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<tr><td>Key Information Sets Information</td><td>
<u>Key Information Set - Module data</u>
Number of credits for this module 15
<table>
<tr><th>Hours to be allocated</th><th>Scheduled learning and teaching study hours</th><th>Independent study hours</th><th>Placement study hours</th><th>Allocated Hours</th></tr>
<tr><td>150</td><td>36</td><td>114</td><td>0</td><td>150</td></tr>
</table>

The table below indicates as a percentage the total assessment of the module which constitutes a -

Written Exam: Unseen written exam
Coursework: Written assignment

Please note that this is the total of various types of assessment and will not necessarily reflect the component and module weightings in the Assessment section of this module description:
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	Total assessment of the module:
	Written exam assessment percentage: 70%
	Coursework assessment percentage: 30%
	Practical exam assessment percentage: 0%
	100%
Reading Strategy	Students will be encouraged to make full use of the print and electronic resources available to them through membership of the University. These include a range of electronic journals and a wide variety of resources available through web sites and information gateways. The University Library's web pages provide access to subject relevant resources and services, and to the library catalogue. Many resources can be accessed remotely. Students will be presented with opportunities within the curriculum to develop their information retrieval and evaluation skills in order to identify such resources effectively. The core text will be Benninga,S. (2014) *Financial Modelling*, 4th Edition, Massachusetts: MIT Press, 2014. Students will be expected to purchase this text. The textbook will be supplemented from time to time with specific references to articles in academic and professional journals. Students will be expected to utilise a range of reading and other materials to undertake further independent research to extend their familiarity and appreciation of the subject and to help them prepare for the in-course assessment and examination in this module. To this end, extensive use will be made of UWE online, additionally, students will also be encouraged to utilise the BBS study skills website (www.uwe.ac.uk/bbs/studyskills).
Indicative Reading List	• Benninga,S., (2014) *Financial Modelling*. 4th Edition, Massachusetts: MIT Press, • Cuthbertson, K. and Nietzche, K,(2001) *Financial Engineering*, Wiley. • Hull, J. C., (2014) *Options, Futures, and Other Derivatives*. 9th Edition, Prentice Hall. • Wilmott, P. (2007) *Paul Wilmott Introduces Quantitative Finance*, 2nd Edition, Wiley. • Black, F., and M. Scholes. (1973) The pricing of options and corporate liabilities. *Journal of Political Economy*, 81. • Cox, J., S., Ross, and M. Rubinstein. (1979) Option pricing: a simplified approach. *Journal of Financial Economics*, 7. • Boyle, P., and S. Lau. (1994) Bumping up against the barrier with the binomial method. *Journal of Derivatives*, 2 • Duffie, D., and K. Singleton. (1999) Modelling term structures of defaultable bonds. *Review of Financial Studies*, 12. • Merton, R. (1974) On the pricing of corporate debt: the risk structure of interest rates. *Journal of Finance*, 22.

Part 3: Assessment	
Assessment Strategy	Formative assessment is provided from the start of the module though tutorials, during which students will work through group work, case studies and computational problems, with feedback from the tutor. Summative assessment will take place during and at the end of the module, and has two components: • The first component [Component A] is a two hour closed book exam.

	This will amount to 70% of the module mark. • The second component [Component B] is a 2,000 word Individual Assignment. The students will be required to apply appropriate tools and techniques in a case study, including demonstrating use of Excel modelling and VBA skills. The students will then discuss their results and approach in an accompanying report. (30% of module mark).

Identify final assessment component and element	**Component A**	
% weighting between components A and B (Standard modules only)	**A:** **70%**	**B**: **30%**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Exam (2 hours)	100%
Component B hours) **Description of each element**	**Element weighting** **(as % of component)**
1. Individual assignment (2000 words)	100%

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Exam (2 hours)	100%
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Individual assignment (2000 words)	100%

If a student is permitted a retake of the module under the University Regulations and Procedures, the assessment will be that indicated by the Module Description at the time that retake commences.